

Abstract Submitted  
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**Control of atomizer turbulence characteristics with indeterminate origin nozzles**<sup>1</sup> FANGJUN SHU, MIRAI ITO, MICHAEL PLESNIAK, PAUL SOJKA, Purdue University — Minimizing overspray is a key concern in spray painting, not only to reduce the raw material costs but also to minimize pollution. Sprays emanating from indeterminate origin (IO) nozzles were evaluated to determine to what extent modification of the turbulence at the spray exit will affect the transfer efficiency (TE) of small droplets near the target region (TE is the fraction of the total mass of liquid sprayed that deposits on the target). Two-peak and four-peak crown nozzles were investigated and compared with a baseline round nozzle spray. Spray results are compared to previous results obtained in a precursor study of the near-field of a large scale water jet with IO nozzle. In these companion studies flow visualization images were taken, as well as PIV and LDV data to examine the influence of IO nozzles on the turbulence characteristics. In the spray, transfer efficiency was measured directly to compare the efficiency of each nozzle

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